

a second cladding layer having a second, opposite conductivity type, said second cladding layer being formed on said active layer epitaxially;

b1
a first electrode provided so as to inject first-type carriers having a first polarity into said second cladding layer; and

a second electrode provided on a bottom surface of said substrate so as to inject second-type carriers having a second polarity,

said buffer layer containing said first type carriers with a concentration level in the range from $3 \times 10^{18} \text{cm}^{-3}$ to $1 \times 10^{20} \text{cm}^{-3}$ and said compositional parameter x larger than 0 but smaller than 0.4 ($0 < x < 0.4$) so as to reduce an interface resistance between said substrate and said buffer layer.

21. (Amended) A semiconductor wafer, comprising:

b2
an SiC substrate having an n-type conductivity; and

an AlGa_{1-x}N layer having an n-type conductivity formed on said SiC substrate with a composition represented as AlGa_{1-x}N,

wherein said AlGa_{1-x}N layer has a carrier density in the range between 3×10^{18} - $1 \times 10^{20} \text{cm}^{-3}$, and

wherein said composition parameter x is larger than 0 but smaller than 0.4 ($0 < x < 0.4$) so as to reduce an interface resistance between said SiC substrate and said AlGa_{1-x}N layer.
